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CLAIMS

1. Process for the treatment of at least one of the electrodes (cathode and/or anode) of a fuel cell,
5 before the said cell is operated, and before or after the said electrode is placed in the said cell, comprising the step consisting in forming a biofilm on at least part of the surface of the said electrode, by immersing the said electrode in a medium capable of
10 causing the growth of biofilms, the said biofilm being intended to catalyse the reaction at the electrode, and the step consisting in simultaneously subjecting the said electrode to a polarization potential.
- 15 2. Treatment process according to Claim 1, in which the medium capable of causing the growth of biofilms is chosen from:
 - natural water, such as river water, well water or seawater;
 - 20 - industrial water, and water derived from a culture medium.
3. Treatment process according to Claim 2, in which the medium capable of causing the growth of biofilms is
25 seawater.
4. Treatment process according to any one of Claims 1 to 3, in which the medium capable of causing the growth of biofilms is a circulating medium.
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5. Treatment process according to any one of Claims 1 to 4, in which the electrode is a cathode.
6. Process according to Claim 5, in which the
35 polarization potential applied to the cathode has a

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value ranging from -0.5 V to 0.0 V with respect to a saturated calomel reference electrode (SCE).

7. Fuel cell comprising at least one cell having an anode compartment supplied with a reducing agent, the said compartment including an anode, and the said cell having a cathode compartment supplied with an oxidizing agent, the said compartment including a cathode, the said compartments being placed on either side of a membrane, characterized in that at least one of the electrodes (anode and/or cathode), prior to the operation of the cell, is coated on at least part of its surface with a biofilm intended to catalyse the reaction at the electrode.

8. Fuel cell according to Claim 7, characterized in that the biofilm coating at least part of the surface of the said electrode is obtained by implementing the process according to any one of Claims 1 to 6.

9. Fuel cell according to Claim 7 or 8, characterized in that the anode and cathode compartments are filled with water, in which an anode and a cathode are respectively immersed and into which, in the respective compartments, a stream of oxidizing agent and a stream of reducing agent are sparged.

10. Fuel cell according to Claim 9, characterized in that the water is water capable of regenerating the biofilm deposited before the cell is put into operation.

11. Fuel cell according to Claim 10, characterized in that the water is circulating water.

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12. Fuel cell according to Claim 7 or 8, characterized in that the oxidizing agent and the reducing agent feed their respective compartments directly in the form of a gas stream.

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13. Fuel cell according to Claim 12, characterized in that the gas stream or streams feeding the compartment or compartments provided with a biofilm have a moisture content such that it allows the said biofilm to be regenerated.

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14. Fuel cell according to Claim 12, characterized in that a stream of water coexists in parallel with the gas stream or streams feeding the compartment or compartments provided with a biofilm, the said stream of water being intended to regenerate the said biofilm.

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15. Fuel cell according to any one of Claims 7 to 14, characterized in that the electrode (anode and/or cathode) is formed from a material chosen from the group comprising stainless steel and aluminium, nickel or titanium alloys.

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16. Fuel cell according to any one of Claims 7 to 14, characterized in that the oxidizing agent is oxygen and the reducing agent is hydrogen.

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17. Electrode (anode and/or cathode) for a fuel cell, which electrode is coated on at least part of its surface with a biofilm, before it is placed in the said cell, and preferably held in a medium capable of regenerating the biofilm.

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18. Electrode (anode and/or cathode) for which the biofilm is obtained by implementing the process according to any one of Claims 1 to 6.